

REMARKS/ARGUMENTS

Favorable reconsideration of this application, in light of the following discussion, is respectfully requested.

Claims 1-7 and 10-15 are currently pending. No claim amendments are presented, thus no new matter has been added.

In the outstanding Office Action, Claims 1, 2, 3, 6, 7, 13 and 15 were rejected under 35 U.S.C. §103(a) as being unpatentable over Onggosanusi et al. (U.S. Pub. No. 2003/0139139, hereafter “Onggosanusi”) in view of Juntti et al. (U.S. Pub. No. 2003/0179814, hereafter “Juntti”), Myoshi et al. (U.S. Pub. No. 2003/0067971, hereafter “Myoshi”) and Sugimoto et al. (U.S. Patent No. 6,661,836, hereafter “Sugimoto”); Claims 4 and 5 were rejected under 35 U.S.C. §103(a) as being unpatentable over Onggosanusi in view of Juntti, Sugimoto, Myoshi, and Walton et al. (U.S. Pub. No. 2004/0082356, hereafter “Walton”); Claims 10-12 were rejected under 35 U.S.C. §103(a) as being unpatentable over Onggosanusi in view of Juntti, Myoshi, Sugimoto, and Song et al. (U.S. Pub. No. 2004/0120415, hereafter “Song”); and Claim 14 was rejected under 35 U.S.C. §103(a) as being unpatentable over Onggosanusi in view of Myoshi, and Sugimoto.

With respect to the rejection of Claim 1 under 35 U.S.C. §103(a), Applicants respectfully traverse this ground of rejection. Claim 1 recites, *inter alia*,

wherein the multipath receiving signal demodulating units and the multipath interference canceling units are serially arranged in stages, a receiving signal received at each of the receiving antennas is directly inputted to all the serially coupled corresponding multipath interference canceling units without having passed through any of the other multipath interference canceling units, each of the stages other than the first stage updates a channel coefficient estimated based on a known pilot signal transmitted from the M transmitting antennas using a multipath interference cancelled signal provided by a multipath interference canceling unit in an upper stage.

Applicants submit that the applied art fails to disclose or suggest at least these features of amended Claim 1.

Primary reference Onggosanusi is directed to a multiple input multiple output (MIMO) scheme for combining transmit diversity and data multiplexing. Onggosanusi describes that a receiver can directly estimate a channel (see para. [0017]). Onggosanusi also describes methods of interference-resistance detection, which include optimal maximum likelihood detection, linear detection, and iterative detection (see para. [0034]-[0038]).

The Office Action acknowledges that Onggosanusi (and secondary reference Juntti) fails to disclose or suggest “a receiving signal received at each of the receiving antennas is directly inputted to all the serially coupled corresponding multipath interference canceling units without having passed through any of the other multipath interference canceling units,” as recited in Claim 1. The Office Action relies on Miyoshi to remedy this deficiency of Onggosanusi and Juntti.

Miyoshi is directed to an interference signal canceling apparatus of which an embodiment is shown in Fig. 4 below.

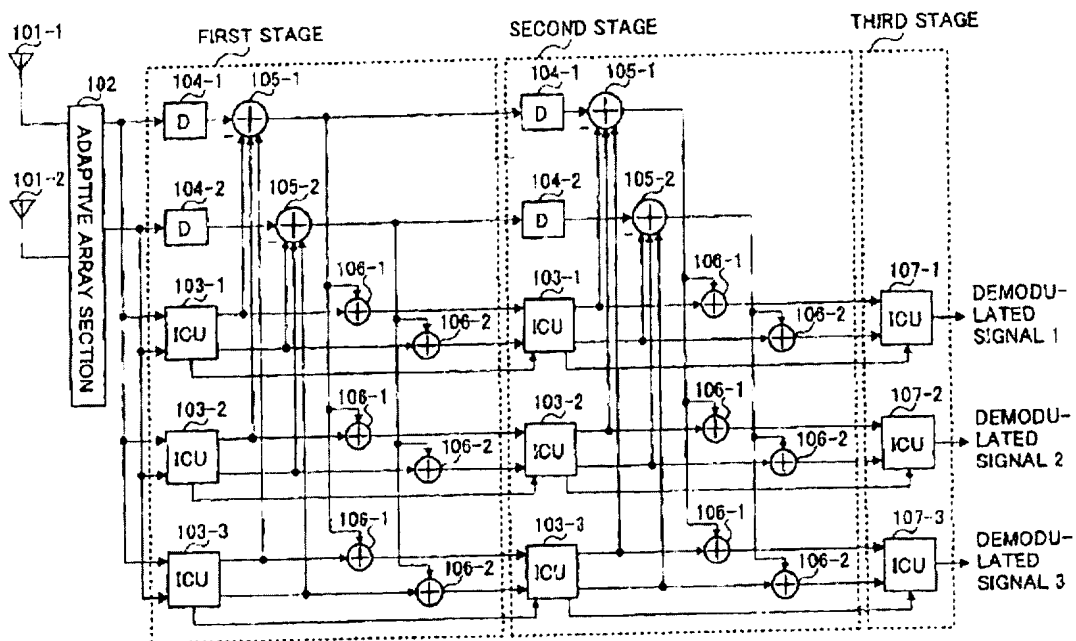


FIG. 4

The Office Action cites to Fig. 4 and paragraphs [0050] and [0051] of Miyoshi as disclosing “a receiving signal received at each of the receiving antennas is directly inputted to all the serially coupled corresponding multipath interference canceling units without having passed through any of the other multipath interference canceling units,” as recited in Claim 1. (See Office Action, on page 4).

Paragraph [0050] of Miyoshi describes that a signal with directivity “A” outputted from the adaptive array section 102 is inputted to ICUs 103-1 to 103-3 and a delay 104-1. Thus, as clearly shown in Fig. 4 and described in paragraph [0050], a receiving signal received at each of the receiving antennas is **sent through adaptive array section 102** before reaching the Interference Canceling Units (ICUs) 103-1, 103-2, and 103-3, **which are coupled in parallel.**

Therefore, Miyoshi clearly does not disclose or suggest a receiving signal received at each of the receiving antennas is **being directly inputted** to all the corresponding multipath interference canceling units.

Furthermore, in Miyoshi, it is clearly shown that each ICU 103-1, 103-2, and 103-3 is coupled in parallel, and therefore Miyoshi does **not** disclose **serially coupled** corresponding multipath interference canceling units receiving the signal from the antenna. Applicants note that in Miyoshi, while there may be a serially coupling of ICUs at a first stage to corresponding ICUs at a second stage, the receiving signal is not directly inputted to any of the ICUs at the second stage. As described in paragraph [0055] of Miyoshi, “[t]he obtained desired signals are inputted to ICUs 103-1 to 103-3 on the second stage, respectively.” Thus, the output of the first stage is inputted to the second stage, but the receiving signal is not directly inputted to the ICUs of the second stage.

Therefore, Applicants respectfully submit that Miyoshi clearly fails to disclose or suggest “a receiving signal received at each of the receiving antennas *is directly inputted to*

*all the serially coupled corresponding multipath interference canceling units* without having passed through any of the other multipath interference canceling units,” as recited in Claim 1.

Sugimoto, Walton, and Song have been considered but fail to remedy the above-discussed deficiencies of Onggosanusi, Juntti, and Miyoshi with regard to Claim 1. Therefore, Applicants respectfully submit that Claim 1 (and all associated dependent claims) patentably distinguishes over Onggosanusi, Juntti, Miyoshi, Sugimoto, Walton, and Song, either alone or in proper combination.

Independent Claim 14 recites features similar to those of Claim 1 discussed above. Therefore, Applicants respectfully submit that Claim 14 patentably distinguishes over Onggosanusi, Juntti, Miyoshi, Sugimoto, Walton, and Song, either alone or in proper combination.

Consequently, in light of the above discussion and in view of the present amendment, the outstanding grounds for rejection are believed to have been overcome. The present application is believed to be in condition for formal allowance. An early and favorable action to that effect is respectfully requested. Furthermore, the examiner is kindly invited to contact the Applicants’ undersigned representative at the phone number below to resolve any outstanding issues.

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